*Meteorologie*, 1881, xvi. 369; *Naturforscher*, 1882, No. 5.) During Baron Nordenskjöld's wintering nerr Pitlekaj, on the Cape Serze Kamen (near Behring Strait) in 1878-79, an ice-fog was formed by the north wind predominating there during the cold season, by which the aqueous vapour from Polynjen was blown over the cold mainland. This ice-fog rendered the air opaque to such an extent that it was found necessary, in order to find the way, to span a rope from the ship to the observatory which was erected not far off on the shore.

Heidelberg, February 11 HERMANN KOPP

### Earthquake in the Andaman Islands

I SEE among the Notes in your last issue (p. 325) that there has been widespread seismic disturbance in Asia, including Ceylon, but unfortunately in no instance is the date given, which would have added very greatly to the value of the record. It may be interesting to give an extract from a letter I have just received from my brother, Mr. Harold Godwin-Austen, from Port Blair, Andaman Islands, which very probably was connected with the disturbance in Ceylon, and if so, it covered a very considerable area of the earth's surface, the distance being about 750 miles between the two places:—"Port Blair, January 2.—We had a very bad earthquake here on December 31, 1881, at 7·52 a.m. I thought the place was going to pieces. There has been a good deal of damage done to work and pucca (brick) buildings, and we had five high and low tides in three hours after the shock, and the sea did not quiet down all day. Since then we have had two or three slight shocks."

Deepdale, Reigate, February 9 H. H. GODWIN-AUSTEN

### The "Overflow Bugs" in California

THE following experience from one of my correspondents, Mrs. A. E. Bush, of San José, California, is, I think, well worth publishing, as showing how Ground-beetles may be so numerous as to become a nuisance to man, the Carabidæ generally being indirectly beneficial to him by devouring plant-feeding species. The insect popularly denominated "Overflow Bug" in California is the *Platynus maculicollis*, Dej.

Washington, D.C. C. V. RILEY

"We lived in Fresno Co. two years, in the north-eastern part, and in the foot-hills of the Sierra Nevada. It is hot and dry there; no trees and many rocks where we were; thermometer ranging from 96° to 108° for about three months. In June and July, when hottest and driest, the "overflow bugs" filled the air between sunset and dark. You could not with safety open your mouth. They would light all over your clothes; they filled the house; they swarmed on the table, in the milk, sugar, flour, bread, and everywhere there was a crevice to get through. Take a garment from the wall, and you could shake out a cupfull. It was a veritable plague. In a shed where the boards had shrunk and the cracks been battened, the spaces between the shrunken boards were packed full. They were flying for about two weeks, and then they disappeared mostly or they did not fly much, but were hidden under papers, clothing, and every available place. In November, before the rains, they spread around, but not to fly; make a light in the night, and you would see the floor covered; lift up a rug, and the floor under would be black, and they would go scattering away for some other hiding-place. I had occasion to take up a floor board after they had apparently disappeared, except stragglers. The house was upon underpinning two feet or more from the ground. When the board was raised, there were the 'overflow bugs' piled up against a piece of underpinning, making such a pile as a half bushel of grain would make. They were all through the foot-hills the same, and much the same in Los Angelos, about Norfolk, but they did not fly much in the latter place. In Los Angelos they seemed to be worse before the 'Santa Annas,' a hot wind from the desert filling the air with sand; and though the chickens were ever so hungry for insects, they would not eat the 'overflow bugs.' In the night you put up your hand to brush one from your face, and then you get up for soap and water to cleanse your hand. In the morning, if you put on garments without shaking, you get them quickly off and shake them."

### Solar Halo

WE were favoured here on the 16th inst. with a view of a rather unusual phenomenon. Shortly after 8 a.m., the sky being for the most part clear with detached masses of fleecy clouds towards the south, two mock suns appeared, one to the west very brilliant, the other rather fainter, and of a crimson shade at times. The halo was visible for a little distance near the western one, which, with the bar of light from the sun extending along the bank of cloud beyond, formed a perfect cross. They gradually waned, the eastern one, however, becoming once or twice more brilliant, till a little after 10, when the sky grew overcast and they disappeared. W. F. EVANS

Felsted, Essex

### Auroral Display

AN auroral display was observed here last evening between 7h. and 8h. The sky was partially overcast during a portion of the time, but it cleared about 7h. 10m., when the northern quarter was lighted up by a bright glow of an aqua-marine line. Only three faint streamers were remarked. They were of a creamy-white colour, and extended from the horizon in the direction of the magnetic north nearly to the zenith. Examining the auroral light with a direct-vision spectroscope by Hilger, I saw one remarkably distinct line, which was estimated to occupy the position of the characteristic line observed by Ångström and others, between D and E. No other lines were visible.

Bedford, February 21 THOS. GWYN ELGER

### A Plea for Jumbo

WILL you open your columns to a short but earnest plea for poor Jumbo, of the Zoological Gardens? No one can read the description of the attempts made to remove him without feeling that it would be a disgrace to English lovers of animals to let him be transported. To outsiders it is a mystery that Mr. Barnum should have succeeded in purchasing him, and if some means are not discovered of satisfying Mr. Barnum's claims without doing violence to the public sentiment of humanity, it will be a cause of indignation to many of us. You should hear my wife talk about the matter, but of course she is only a woman, she is certainly not a "Fellow." In this case, however, it is possible that her womanly instinct is worth more respect than the motives which have led to the sale and purchase of our favourite quadrupedal fellow-citizen. A. R.

## *THE CHEMISTRY OF THE ATLANTIC*[1]

### I.

IN this work are collected and discussed the results of the chemical investigations on the nature of the water of the North Atlantic, made during the Norwegian expeditions of the summers 1876, 1877, and 1878. The contents of the volume are divided into three chapters—I. On the Air in Sea Water; II. On the Carbonic Acid in Sea Water; and III. On the Amount of Salt in the Water of the Norwegian Sea. It is therefore wholly concerned with the chemistry of the water; chemical researches in other directions are promised for a future volume. Although the subject is thus restricted, there is abundant matter of the greatest interest both from a chemical and from a geographical point of view.

Apart from isolated experiments, the first occasion on which the gaseous contents of sea-water were the object of systematic and successful study was during the German expeditions to the Baltic and the North Sea in 1871 and 1872 in the *Pomerania*. In the *Lightning* and the *Porcupine* attempts had been made to examine the water in this direction, but the results were not satisfactory. In order to determine the gaseous contents of a sample of water it is necessary first to eliminate and separate the gas from the water, and then to analyse it; and these form two distinct operations—one, the former, of which can be carried out perfectly on board ship; the other requires the steadiness of a shore laboratory. On board the *Lightning* and the *Porcupine* the mistake was made of attempting the analysis as well as the extraction of the air on board.

[1] The Norwegian North Atlantic Expedition, 1876-78. Chemistry. By Hercules Tornoe. (Christiania: Grœndal and Son, 1880.)

© 1882 Nature Publishing Group

Dr. Jacobsen, the chemist of the *Pomerania* Expedition, has the merit of being the first to have rendered practicable the carrying out of such operations as the extraction of the gases and the determination of the carbonic acid in sea-water at sea. In subsequent expeditions his apparatus has been used with but slight modifications. His apparatus for extracting the oxygen and nitrogen was used on board the *Challenger* and by Dr. Tornoe without alteration; the method of determining the carbonic acid was modified both on board the *Challenger* and on the Norwegian expedition.

In the first chapter, "On the Air in Sea Water," Dr. Tornoe describes the apparatus used for obtaining samples of the water at different depths. In principle it resembles most other instruments devised for the same purpose, consisting of a tube which is open at both ends while descending, thus allowing the water to pass freely through it. On reversing the motion, the two ends are closed by conical valves worked by screw fans. In construction, however, it differs widely from other instruments of the same kind. Instead of being straight the tube, which forms the body of the instrument, is spiral, and holds about five litres. The diameter of the tube is 5·5 centimetres, and the external diameter of the spiral is 33·5 cm., the total length of the instrument over all being 144 cm., or nearly 5 feet. These measurements are taken from the plate accompanying the book, and it is apparent from them that the instrument is one of very considerable size; it is a pity that its weight is not given. Both ends of the spiral tube have conical valve seats, the smallest diameter of which is equal to that of the tube. The valves fitting these apertures are kept open during descent by the action of screw-fans, which turn in one direction during descent; when the direction of the motion is reversed and the ascent commenced, the first few turns of the screw-fans are used for bringing the valves close to their seats, when, being released from the screws, they are pressed home by a pair of spiral springs. In order to do the necessary work on the screws, the instrument has to travel through about seven fathoms of water. The water, therefore, which it brings up will be a fair average sample of the particular seven fathoms through which it was drawn. The instrument appears to have given great satisfaction, and it has many good points in its construction. The spiral form of the tube is an ingenious contrivance for increasing its capacity without unduly lengthening the whole apparatus, but the spiral form also produces an increased resistance to the passage of the water, so that what passes through will lag behind what passes outside the instrument. Hence the sample actually inside the tube at any moment is a sample of the water a certain number of fathoms above it, and not of the water in the centre of which it is plunged. For ocean work this is not a serious drawback, and it is in a great measure corrected by the necessity for hauling it backwards through seven fathoms of water before it is closed. The arrangement for working the valves is very ingenious, and permits the use of several instruments on one line, for the instrument requires to traverse seven fathoms of water in order to close, and this is much more than would be traversed by it with the line held fast and exposed only to the rolling motion of the ship. This advantage, however, is rendered nugatory by the great size of the instrument, as one of them would be a sufficient load for any line. It is evident that for taking samples at small intervals of depth as every five fathoms, the instrument would have to be modified, or one of the other existing forms used; but for the collection of the samples which actually were taken, the instrument was quite satisfactory. Its inventor was Capt. C. Wille of the Norwegian navy.

The apparatus used for boiling out the gases is exactly that recommended and figured by Jacobsen in Liebig's *Annalen*, vol. 167, p. 1. It consists of three parts—*a*, the flask for the reception of the sea water to be boiled, its capacity is about 900 cub. centims.; *b*, the bulb tube, fitted into the mouth of the flask by an india-rubber cork, which, with the tube, forms a most ingenious kind of slide-valve, enabling connection between the flask and the remainder of the apparatus to be made or broken at will. This bulb-tube serves a double purpose: at first it contains a supply of distilled water, which, being converted into steam, drives all the air out of the upper part of the apparatus, and so enables a vacuum to be formed; in the latter part of the operation it serves for the reception of the sea water which expands into it out of the flask during the process of boiling. The third part of the apparatus, *c*, is the gas-tube in which the sample of gas is sealed up and preserved when it has been extracted from the water. This tube, which ought to have a capacity of about 60 or 70 cub. centims., resembles a pipette whose end-tubes are reduced to a length of 5 or 6 centimetres, and are contracted to a very small diameter near the body. It is attached to the bulb-tube by a piece of good india-rubber tubing, care being taken that the ends of the two tubes abut. By the boiling of the distilled water in the bulb-tube at the commencement of the operation all the air is expelled, and the apparatus hermetically closed by sealing up the gas-tube at the contraction at its upper end. During this operation communication is interrupted, by means of the slide-valve, between the flask and the bulb-tube. After the upper end of the gas-tube has been closed, communication is re-established, and the water in the flask now finds itself exposed to the action of a tolerably good vacuum, and in consequence the air dissolved in it immediately begins to be disengaged; this is assisted by heating in a water-bath. When it is judged that the air has all been expelled from the water, the flask is again isolated by means of the slide-valve, and the gas-tube sealed up at the lower contraction and preserved for analysis. As there is always some of the gas remaining in the bulb-tube, the space so occupied is measured and noted, so as to be taken into account in determining the total volume of gas per volume of water. The beautiful part of this apparatus is the slide-valve arrangement, which was invented by Dr. Behrens of Kiel. Otherwise the apparatus does not differ from that described by Bunsen, and used by him in Iceland. Had it, however, been necessary to use Bunsen's apparatus unmodified, it may safely be assumed that we should now have very few analyses of the air dissolved in sea water. It is Dr. Behrens' invention which renders the operation sufficiently easy to enable it to be carried out successfully as a matter of routine at sea.

There is another item in the construction of the instrument which, though apparently insignificant, is really of the utmost importance in insuring a successful result—it is the way in which the contraction in the two end tubes of the gas tube is made. The tubes supplied to the Norwegian Expedition seem to have been much the same as those supplied to the *Challenger*. Both came from Thuringia in Germany, and in the *Challenger* ones the contraction was formed by thickening up the tubes before the blowpipe, so that the external diameter was not diminished, while the internal diameter was reduced often beyond what was necessary. Now in attempting to close the tube with the blowpipe at one of these thickened contractions, the thin and comparatively wide tube on either side of the thick contraction is very apt to be heated up to softening point before the much more massive contraction has got even hot. In the inside of the tube, however, there is, even after the boiling, a much lower pressure than in the outside atmosphere; consequently, immediately the tube next the contraction gets soft, it falls in, and though the tube may be drawn out, and so appear for the moment to be satisfactorily closed, the point so formed never fails to crack on cooling. This is the reason of the deplorable loss of as much as 75 per cent. of the gas samples boiled out by Dr. Tornoe on his last voyage. A

© 1882 Nature Publishing Group

similar experience was made with the first few samples boiled out on board the *Challenger*, but it was detected in time to prevent any serious loss. Indeed from dust and particles of sawdust having got into the tubes, it was necessary in every case, before using a gas tube, to remove its end tubes, clean the body thoroughly, re-attach the end tubes, and *draw out* the thickened contraction. When so drawn out, there is not the same mass of glass to be heated, and the contracted part can be heated for itself without any danger of softening the wide part. There was no instance of a tube cracking after being sealed up with these precautions. In recent practice the writer has considerably modified and improved the apparatus for extracting gases from water on shipboard, but a description of the apparatus would here be out of place.

The figures representing the results of the analyses are necessarily affected by errors incident to the collection and the transvasing of the water and to the separation and analysis of the gas. The combined effect of these errors can be appreciated by the study of the following table, in which are collected the results of analyses made in duplicate. It is not stated whether on each occasion two separate and distinct samples were collected and treated separately, or, from the same sample of water, two portions were separately boiled, and thus two portions of gas obtained for analysis. Of the nine waters so treated four came from the surface, three from the bottom, and one from an intermediate depth of 300 fathoms.

*Table of Duplicate Analyses*

| Station No. | Depth (fathoms). | O + N cc. per litre. | Difference. | Oxygen per cent. | Difference. |
|---|---|---|---|---|---|
| 125 | 700 (Bottom) | 20·5<br>20·0 | 0·5 | 33·0<br>33·6 | 0·6 |
| 162 | 795 (Bottom) | 20·6<br>19·4 | 1·2 | 32·6<br>33·7 | 1·1 |
| 213 | 1760 (Bottom) | 19·6<br>— | — | 34·0<br>33·8 | 0·2 |
| 332 | 1149 (Bottom) | 21·9<br>22·0 | 0·1 | 32·2<br>31·8 | 0·4 |
| 345 | 300 (Intermediate) | 20·9<br>21·5 | 0·6 | 34·4<br>33·9 | 0·5 |
| 183 | Surface | 20·0<br>— | — | 36·1<br>36·1 | 0·0 |
| 283 | Surface | 19·8<br>19·5 | 0·3 | 35·4<br>35·3 | 0·1 |
| — | Surface | 20·7<br>— | — | 35·8<br>35·4 | 0·4 |
| 323 | Surface | 19·3<br>— | — | 36·5<br>35·8 | 0·7 |

From this table we see that the mean difference in oxygen per cent. as found in the different analyses of the gas from the same water was 0·5. The differences in the total volume of nitrogen and oxygen per litre varied from 0·1 cc. to 1·2 cc.

Dr. Tornoe has collected at pp. 15 and 16 the results of his analyses of ninety-four samples of air extracted from water of various depths. Of these thirty-three are from surface water, eighteen from intermediate, and forty-three from bottom water. The last-mentioned are from a great variety of depths, ranging from 25 to 1760 fathoms. His results give us a very complete account of the state of aëration of the water of the "Norwegian Sea," or of that part of the ocean extending from the Faröe Islands northwards to Spitzbergen, having for the greatest part of its length the shores of Norway for its eastern boundary. The investigations were carried on between the middle of June and the middle of August, or during the height of summer, consequently the temperature of the surface water was never either very high or very low. In the table of results the temperature of the water is given. Of the surface waters examined the mean temperature was 6·6 C., the highest being 11·8°, and the lowest 0·5° C. If the total volume of the oxygen and nitrogen be taken to be 100, then the oxygen was found to vary between 33·7 and 36·7, mean 35·4. The absolute amounts of the gases varied with the temperature.

The results obtained by Jacobsen in the *Pomerania* showed a very remarkable agreement in the percentages of oxygen found in the surface water. The mean results of twenty-one observations were as follows:—Temperature 16·66° C., nitrogen 11·07 cc., oxygen 5·69 cc., together 16·76 cc. per litre, and oxygen percentage 33·93. The lowest oxygen percentage was 33·64, and the highest 34·14. From this it was concluded that the percentage of oxygen in sea water is practically invariable, as it is in the atmosphere. For the limited area explored by the *Pomerania* this is undoubtedly proved, but the area was comparatively small and the variations in conditions, especially temperature, insignificant. In the *Challenger*, waters subject to the most varied conditions of climate were treated for the extraction of the gases, and before leaving the work of the expedition, now more than four years ago, the writer had analysed a considerable number of the samples of gas so procured. The results of these analyses showed at once that Jacobsen's conclusion as to the ocean as a whole was not justified, while it held good with regard to limited areas. If we confine our attention to surface water, the highest percentage was 35·01 in the Antarctic Sea, and the lowest 32·35 in the Pacific, between Fiji and Torres Straits. This was however a very remarkable water, and should be excepted. The next lowest percentage was 32·82, so that in round figures the oxygen percentage varied between 33 and 35. As the cruise of the *Challenger* was chiefly in tropical regions, the surface water had usually a high temperature; but water of all temperatures was experimented on, and if the results are arranged in ascending order of temperature, the oxygen percentage is seen to decrease very regularly.

In waters of temperatures above 20° C. the percentages ranged between 32·82 and 33·33, the mean of nine such observations being 33·09. The mean of five observations between 12° and 20° is 34·22, the extremes being 33·52 and 34·66. We gather from the results of the three expeditions that the percentage of oxygen is less in warm water than in cold.

In order to judge of the degree of saturation of the waters Dr. Tornoe reports some interesting experiments on the absorptive power of sea water for the atmospheric gases at different temperatures. He experimented on four temperatures, namely, 0° C., 5°, 10°, and 15° C., and from the results so obtained he gives the following formulæ for the solubility of nitrogen and oxygen in sea water exposed to a current of air:—

$$N = 14·4 - 0·23t$$
and
$$O = 7·79 - 0·2t + 0·005t^2.$$

The formula for nitrogen agrees with the facts of his observations at the four temperatures: that for oxygen begins to fail at the highest temperature, 15° C., and is clearly inapplicable at temperatures above 15° C., for it gives a minimum of solubility at 20°, and at 40° C. this solubility is the same as at 0° C., and is increasing.

The analyses of the gas from surface water do not agree very well with the figures given by his nitrogen formula. Jacobsen's results are also higher than would be given by the formula, and the *Challenger* results considerably higher. The last are better represented by the formula—

$$N = 15·8 - 0·23t.$$

Dr. Tornoe notices that the oxygen found by him in surface water is considerably in excess of what would be

© 1882 Nature Publishing Group

given by his formula, but as the formula is clearly inaccurate for temperatures above 10° C. it is premature to conclude, as he does, that the surface water is supersaturated with oxygen. J. Y. BUCHANAN

(*To be continued.*)

## THE BOSTON SOCIETY OF NATURAL HISTORY, 1830-1880

THE Boston Society of Natural History was founded in 1830 by a few earnest men, and in 1880 it resolved to commemorate its fiftieth anniversary by the publication of an historical sketch of its origin and life, and of a special series of scientific memoirs. This resolution has been carried into effect by the issue of a splendid quarto volume of over 600 pages and 40 plates, the paper and typography of which is worthy of the Boston Press.

Very interesting is the account given of the early struggles and early successes of this now so well-known institution. Preceded by the Linnean Society of Boston (founded in 1814), which at first made rapid progress and then gradually fell away, it was duly constituted in May, 1830, with Thomas Nuttall as president. At this time, Mr. S. H. Scudder states, there was not in New England an institution devoted to the study of natural history; there was not a college, except Yale, where even the modern views of geology were taught. The few labourers in the field of natural science worked alone, without aid or encouragement, and were regarded as triflers by a busy public. To go through the records of its early days, however briefly, would take up too much of the space at our disposal.

Once started into existence, the Society found itself with the responsibility of a rapidly increasing museum; and the demands upon its pecuniary resources, even though an enormous amount of gratuitous service was rendered by the members, soon began to be very troublesome. Generous and wealthy members replenished the empty treasury, and after its first ten years' existence (1830-40) it found itself, after a hard pinch, just free from debt. In 1841 the publication of the *Journal* of the proceedings commenced. Louis Agassiz joined the Society in 1847. Dr. Amos Burney, its president, died the same year at Rome. In 1848 the members assembled in a new house in Mason Street, and the close of a second decade (1840-1850) found them just holding their own.

Already in 1855 it became evident that the new abode was becoming all too small for the collections; and now it was well for the Society that they found so good a friend in John C. Warren, for he largely assisted in procuring the means for purchasing the present accommodation, though another ten years (1850-60) passed away, and it was not until 1861 that Dr. William J. Walker presented the Society with the estate in Bulfinch Street, where the Society's fine museum and library now stands. The magnificent donation of 10,000 dollars from Mr. Jonathan Philips, the products of the sale of the house in Mason Street, with many generous subscriptions, enabled the Society to think of building on the site presented to them by Dr. Walker, but on consideration they found that they had not more than half the money amount required. In this emergency Dr. Walker came again to their aid, presenting them with a gift of 20,000 dollars, on condition that a further sum of like amount were raised. The year 1864 found the Society in its present handsome edifice (the building of which had cost 80,000 dollars) and trying to solve the problem of how to keep up so spacious a mansion on its comparatively small resources. With wondrous liberality Dr. Walker once more offered a donation of 20,000 dollars, on the condition that a like amount were subscribed by others, the whole to form a working capital to be funded. This became an accomplished fact in May, 1864, but this was not all, for on Dr. Walker's death in April, 1865, it was found that he had left by will a large fortune to the Society, and following this good example ere this fourth (1860-70) decade passed away, other liberal members had subscribed some 50,000 dollars to the capital of the Society, thus establishing the Institution on such a firm foundation as to secure its perpetuity as long as wisdom shall prevail in its Councils. Its property, besides the buildings with their inestimable contents, consisted of vested funds, amounting to 186,898·20 dollars, and a fair annual income from members.

The fifth decade, the celebrating of the close of which took place in April, 1880, was chiefly noted for the progress that was made in a scientific arrangement of the collections of the Society, under the custodianship of Mr. Hyatt; by the deaths (1874) of Louis Agassiz, about whose early career some very interesting facts are given, and (1874) of Jeffries Wyman, of whom there is a short biography, of Charles Pickering 1878), of C. F. Hartt (1868), and of T. M. Brewer (1880).

There is a very valuable account of the Teachers' School of Science, which seems in Boston to have attained a great success, and a summary of the general contents of the Museum. Very excellent portraits of Benjamin D. Greene, George B. Emerson, Amos Binney, J. C. Warren, Jeffries Wyman, and Thomas T. Bouvé, being the first six presidents of the Society, accompany this part of the volume and also a history of Dr. William J. Walker, and engravings of the portraits of A. A. Gould and Dr. Humphreys Storer.

The second portion of this fine memorial volume is devoted to the publication and illustration of a series of memoirs, of which we must be content with the bare enumeration of their titles. These are thirteen in number, and are profusely illustrated: N. S. Shaler, Propositions concerning the Classification of Lavas considered with Reference to the circumstances of their Extrusion; A. Hyatt, the Genesis and Evolution of the Species of Planorbis at Steinheim (ten plates and a map); S. H. Scudder, the Devonian Insects of New Brunswick, with a Note on the Geological Relations of the Fossil Insects from the Devonian of New Brunswick, by Dr. J. W. Dawson (one plate); W. G. Farlow, on the Gymnosporangia (Cedar Apples) of the United States (two plates); Theodore Lyman, on a New Structural Feature, hitherto unknown among Echinodermata, found in Deep Sea Ophiurans (two plates); W. K. Brooks, the Development of the Squid (*Loligo pealii*, Les.), three plates; A. S. Packard, jun., the Anatomy, Histology, and Embryology, of *Limulus polyphemus* (seven plates); Edward Burgess, Contributions to the Anatomy of *Danais archippus*, Fab. (two plates); Saml. F. Clarke, the Development of a Double-Headed Vertebrate (one plate); C. S. Minot, Studies on the Tongues of Birds and Reptiles (one plate); Edward S. Morse, on the Identity of the Ascending Process of the Astragalus in Birds with the Intermedium (one plate); Lucien Carr, on the Crania of New England Indians (two plates); William James, the Feeling of Effort.

## THE PHYSIOGNOMY OF CONSUMPTION[1]

THE idea that a certain type of face indicates a tendency to certain diseases is not only widely diffused in the medical profession, but among the public at large, as is shown by the frequent occurrence of such phrases as "consumptive-looking," and "apoplectic-looking." With a view to ascertaining how far these generally-entertained ideas are true, and of substituting for mere personal impressions the test of exact and unprejudiced investigation, the authors of this paper have made a number of observations by the method of composite portraiture, already described by Mr. Galton in NATURE. The countenance which is supposed to indicate a tendency to phthisis or

[1] "An Inquiry into the Physiognomy of Phthisis, by the Method of Composite Portraiture." By Francis Galton, F.R.S., and F. A. Mahomed, M.D.

© 1882 Nature Publishing Group